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## FIRST REPORT OF PROFESSOR BOWMAN'S EXPEDITION

In a letter dated Antofagasta, Chile, July 10, 1913, the Society has received from Professor Bowman the following account relating to the first part of the expedition to the Central Andes he conducted during the past summer under the Society's auspices, the plans of which were outlined in the May *Bulletin* (Vol. 45, 1913, pp. 348-351). Professor Bowman's route may be followed on the accompanying sketch map.

SAN PEDRO DE ATACAMA, CHILE  
July 2nd, 1913.

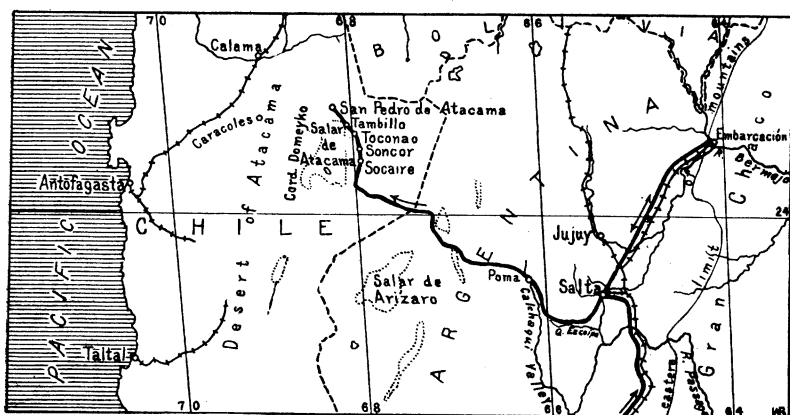
The expedition reached Salta, Argentina, on June 5th. A pack train was immediately fitted out and work begun on the Andean Cordillera on the west. Before starting for the mountains a short journey was made to Embarcación on the edge of the Gran Chaco where by chance we met Baron Erland Nordenskiöld, Director of the Museum at Göteborg, who was just starting out on a two years' ethnological exploration of the Gran Chaco.

From Salta the mountain trail runs west over the border ranges via the *quebrada* Escoipe, famous because it was by that route that Almagro, Pizarro's lieutenant, made his great march to Copiapo, Chile. Thence it ascends the deep Calchaqui Valley via La Poma to the La Paya *quebrada* which climbs up to the level of the vast Puna de Atacama, the region of volcanoes and borax basins. Our camps in the Cordillera were between 12,000 and 14,500 feet and our highest pass 16,800 feet. The minimum temperature experienced was  $-4^{\circ}$  F. ( $-20^{\circ}$  C.), and many other camps were made in temperatures between  $+10$  F. ( $-12^{\circ}$  C.) [and—?]. The last day and a half in the mountains we rode into a most fatiguing wind with temperatures between  $+1^{\circ}$  F. ( $-17^{\circ}$  C.) at 6 A. M. and  $+42^{\circ}$  F. ( $+5^{\circ}$  C.) at 2 P. M. But the earlier part of the journey was made in delightful weather, somewhat like our Indian Summer and called by the natives "El Verano de San Juan" after the feast of St. John, June 24th. At the end of a month's work we arrived at San Pedro de Atacama in good condition, having suffered nothing more than an attack of tonsillitis due to the combination of dust and cold, and during the last week we have been troubled with eczema on feet and also ankles.

It is difficult to say what part of our journey has been the most interesting, so novel and important is the region of borax basins, great volcanoes, and lofty plateaus through which we have just come. Perhaps the most important single feature is the life of the pastoral nomads on the western flank of the Cordillera where the long spurs of the volcanoes run down into the alluvium on the

border of the Salar de Atacama. Here, in a highly remote section of the mountains are preserved some of the ancient customs of the Incas, such as the communal vicuña hunts; here, too, are the annual migrations of the shepherds from the cold mountains to the warmer lower valleys of the pampas. The migrations are quite different from the feeble movements of the mountain shepherds farther north. Here the cold of winter is too intense for a prolonged stay in the mountains, and snow now and then blocks the passes so that the indispensable flocks of the mountain Indians can not be risked in the higher valleys and plateaus. In the great snowstorms movement across the Cordillera is impossible.

In the face of these risks a cattle trade is conducted across the mountains which without exception is the most extraordinary trade of its kind in the world. Every year between 25,000 and 35,000



Professor Bowman's Route in Northern Argentina and Chile, June-July, 1913. 1:8,300,000.  
The route is shown by the heavy line.

cattle are sent over the passes between Salta and Jujuy on the one hand and Calama and San Pedro de Atacama on the other and the winter driving is carried on almost as regularly as that of summer except during the short periods of storm. From the scattered *campos* of the Gran Chaco east of the Cordillera cattle are driven to Embarcación at the end of the railroad, shipped to the corn and alfalfa fields of Salta to be fattened, to the mountain pastures of Luricatao to become accustomed to the cold and the altitude, driven across 15,000 feet passes, forced across waterless plateaus and deserts absolutely without pasture of any kind through the deep hot sands of the piedmont on the western border of the Salar de Atacama, to be rested and fed on dry alfalfa for two days at San Pedro de Atacama. Then at the end of three days' march across a barren desert they arrive at the nitrate *oficinas* near the Pacific coast to become, in their toughened and emaciated condition, the food of the laborers in the nitrate works of the Desert of Atacama!

Skeletons of cattle line scores of miles of the worst parts of the trail. At one point there are over seventy where a herd of more than one hundred perished in the great storm of July 22-26, 1911, when several herders lost their lives and the passes remained closed for two weeks. What with dust and cold and heavy northwest winds, especially the terrible *viento blanco*, both cattle and men often reach the desert on the west scarcely able to walk. Little stone shelters a foot or two high are built at short intervals and every boulder beside the trail is a refuge behind which the herders seek temporary relief from the cold wind.

Next in interest are the chinchilla hunters who come from the little villages strung along the western edge of the mountains where the coastal desert begins. They range over the entire Cordillera but find their best supply in the line of volcanoes on the west. In one of their recent journeys into an almost unknown portion of the Cordillera Domeyko they came across a *pucará*, or old abandoned Indian fortress, and beneath an altar stone discovered a silver figure of a woman, a figure of a llama in gold, and that of a man in stone, all in miniature, and also small *mantas* and blankets of vicuña wool beautifully designed and of extraordinarily fine texture. We have photographs of all the objects, which have never before been found in this part of the Cordillera.

On the walls of one *quebrada* we encountered that extremely rare—in fact almost unknown—petroglyph, a design of a chinchilla skin, done to scale and faithful even to the minutest detail. At another point we encountered that equally rare thing, a petroglyph now in the making, where designs are still incomplete and the marks of the stone hammers are still fresh. Also new to me was the *apacheta* with a lined chamber where offerings of coca cuds, whittled sticks and candles are left by passing Indians. It was a kind of shrine and not merely a rough pile of stones of the ordinary kind.

The vast borax basins and the desert *salar*s were equally interesting, the one because of their genetic relation to the volcanoes and their cold isolated situations where even the mountain Indian shrinks from contact with the winter, the other because of their curious peoples and pleasant oases. San Pedro de Atacama, Toco-nao, Soncor, Socaire, are entrancing after a month in the bleak valleys and lofty plateaus of the Cordillera. Here once more are trees, green fields and hospitable people. The nights however are extremely cold. At Tambillos, altitude 8,000 feet, we had +5° F. (—15° C.) at 6 A. M. and +88° F. (+83° C.) at 2 P. M., a range of 83° F. (46° C.) in eight hours.

Among the desert towns San Pedro de Atacama stands out most prominently both in size and interest. It is a city of *arrieros* and carriers for the whole mountain region to the south and east and at one time even shipped general merchandise to Salta. It now receives and feeds cattle from Argentina. Its rise as a trading town is owing to the convergence of many desert and mountain

trails on this green spot in the middle of a vast desert. Each trail leads to an important town at some distant point. As the town grew streets were laid out—the improved terminals of the trails. So to-day each street bears the name of an ancient trail and each trail in turn bears the name of the distant place to which it leads,—hence Antofagasta street, Calama street, Caracoles street, etc. There is not a single street in the town but bears the name of a distant city.

We shall be able to complete our program on time if no accidents occur. So far we have had unusually good luck and no delays. The region has proved to be even more interesting than I had supposed. From the human standpoint it is by far the most important section of the whole Central Andes.

ISAIAH BOWMAN.

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## THE CROCKER LAND EXPEDITION

The expedition sailed from Brooklyn on July 2 for Smith Sound on the steam whaler *Diana*. A dinner to the scientific staff was given by members of the organizing committees at the University Club on July 1. On this exceedingly pleasant occasion speeches were made by the entire exploratory staff; by President Henry F. Osborn of the American Museum of Natural History; by Dr. E. O. Hovey, who spent many months most successfully in working out all the details of the enterprise; by Dr. Walter B. James, Vice-President of the American Geographical Society; by President William DeWitt Hyde of Bowdoin College, Me., two of whose alumni are members of the expedition; and the closing speech was by Rear Admiral Peary.

The June *Bulletin* (pp. 449-450) gave the names and summaries of the work of Donald B. MacMillan, A.M., leader and ethnologist of the expedition, W. Elmer Ekblaw, A.M., geologist and botanist, Ensign Fitzhugh Green, U. S. N., engineer and physicist, and Morris C. Tanquary, Ph.D., zoologist. In addition to these members of the staff Dr. Harrison J. Hunt was later appointed surgeon, Jerome Lee Allen expert electrician and wireless operator, and Edwin S. Brooke, Jr., official photographer, to return this fall. It is the general opinion that this is one of the most carefully planned and completely equipped expeditions that has ever left our country for the Arctic.

The *Diana* took most of the expedition's equipment from New York, but called at Boston on July 4 and 5 for seven tons of pem-